

## **Depleted Uranium (DU)**

For Service members and their Families

### **Important Facts**

- Depleted uranium (DU) is 40 percent less radioactive than naturally occurring uranium.
- Uranium is a common heavy metal that each of us is exposed to routinely.
- Many independent studies and investigations have found that radiation from DU does not pose a significant health risk. Any illnesses that might develop would primarily affect the kidneys.
- Service members who have inhaled DU particles or who have retained DU fragments in their bodies have shown no long-term health effects – from either radiation or heavy metal toxicity – after more than a decade of close medical monitoring.

### Where is naturally occurring uranium found?

Uranium is found nearly everywhere in our environment, and we are exposed to small amounts of it everyday in the air we breathe, in our food, and in our drinking water. Surveys by the Centers for Disease Control and Prevention show that each U.S. citizen has about 80 micrograms of uranium in their body. The Agency for Toxic Substances and Disease Registry estimates that the top one foot of soil in each square mile of the earth contains an average of about 4 tons of naturally occurring uranium. Other daily sources of natural radiation include cosmic rays and radon. As a result, we all are constantly exposed to the low amounts of radiation.

### What is Depleted Uranium (DU)?

When natural uranium is processed into more highly radioactive forms (enriched uranium) for nuclear reactor fuel or nuclear weapons, DU is the material left behind. Because most of the highly radioactive components are removed, DU is 40 percent less radioactive than natural uranium and has less than 1 percent of the radioactivity as enriched uranium.

## What are the scientific conclusions about the radiation risk from DU?

The findings from extensive scientific research examining DU radiation exposures are that these exposures do not appear to pose any health risks. Although there may be some who take issue with such findings, many independent organizations outside of the Department of Defense (DoD) have also studied

health risks associated with DU, and some of their conclusions are:

Department of Health and Human Services, Agency for Toxic Substances and Disease Registry (ATSDR) in 1999 Toxicological Profile for Uranium.

"No human cancer of any type has ever been seen as a result of exposure to natural or depleted uranium." http://www.atsdr.cdc.gov/toxprofiles/tp150.html

World Health Organization, April 2001 Report.

"The radiological hazard is likely to be very small. No increase of leukemia or other cancers has been established following exposure to uranium or DU." <a href="http://www.who.int/mediacentre/factsheets/fs257/en/">http://www.who.int/mediacentre/factsheets/fs257/en/</a>

#### How is DU used?

Because of its hardness and armor-piercing ability, DU is used in munitions to disable enemy armored vehicles. It is also used in U.S. tank armor to protect service members. The use of DU in armor-piercing munitions allows enemy tanks to be more easily destroyed, thus increasing the likelihood that our own service members will not be harmed. Other uses of DU in both the civilian and military communities include its use as a counterweight to balance aircraft and boats, and as radiation shielding in medical equipment and industrial operations to protect people from radiation.

#### How could I be exposed to DU?

DU that remains <u>outside</u> of the body does not constitute a health hazard except under very unlikely conditions where there would be nearly constant external exposure to large amounts of DU 24-hours a day for years at a time. Routinely working in a tank with DU armor or handling DU munitions does not constitute an exposure to DU that will cause any illness. <u>Internal</u> exposure to DU can occur by inhaling DU dust particles in the air inside armored vehicles after they are hit by DU munitions, through wound contamination, through ingestion of DU dust when contaminated hands contact one's lips or mouth, or as a result of DU fragments (from DU munitions or armor) remaining in the body.

Service members who may encounter a significant exposure to DU include those who are inside or close to armored vehicles when they are hit by DU munitions, those who routinely enter

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damaged vehicles after they are hit, those who are wounded by DU metal fragments, or who fight fires involving DU-containing materials. Individuals near some aircraft crash sites may also be exposed to DU dusts from burning DU counterweights when there is prolonged intense heat. Only a very limited number of people would be exposed to enough DU to require medical testing, and even then, there is no evidence that these people are at any risk of illness caused by the DU.

What are possible health effects of DU exposure?

Heavy metals like uranium (including DU) can possibly cause harm when taken into the body depending on the amount entering the body. When uranium reaches the bloodstream, it is filtered by the kidneys, which removes approximately 70% from the bloodstream within 24 hours; about 90% of the DU is removed within a few days. Because of the large amount of DU passing through the kidneys, it is possible that some kidney damage could occur, although there have been no reports of kidney damage in any of our service members.

# Is there a medical screening or follow-up program for personnel exposed to DU?

Since the kidneys naturally remove all types of uranium from the bloodstream, urine tests are useful in identifying individuals exposed to higher than normal amounts of uranium, including DU. Urine uranium levels can indicate whether service members have ongoing exposures to DU caused by retained DU fragments in the body. Only those with possible high-level DU exposures must be screened for DU exposure with a urine test, although those with incidental exposures can also request screening. The DoD maintains a medical screening program to track service members who have been exposed to DU. Details about the program are at:

<a href="http://www.deploymentlink.osd.mil/du\_library/pdfs/policy\_oif\_053003.pdf">http://www.deploymentlink.osd.mil/du\_library/pdfs/policy\_oif\_053003.pdf</a><a href="https://www.deploymentlink.osd.mil/du\_library/pdfs/policy\_oif\_053003.pdf">https://www.deploymentlink.osd.mil/du\_library/pdfs/policy\_oif\_053003.pdf</a><a href="https://www.deploymentlink.osd.mil/du\_library/pdfs/policy\_oif\_053003.pdf">https://www.deploymentlink.osd.mil/du\_library/pdfs/policy\_oif\_053003.pdf</a><a href="https://www.deploymentlink.osd.mil/du\_library/pdfs/policy\_oif\_053003.pdf">https://www.deploymentlink.osd.mil/du\_library/pdfs/policy\_oif\_053003.pdf</a><a href="https://www.deploymentlink.osd.mil/du\_library/pdfs/policy\_oif\_053003.pdf">https://www.deploymentlink.osd.mil/du\_library/pdfs/policy\_oif\_053003.pdf</a><a href="https://www.deploymentlink.osd.mil/du\_library/pdfs/policy\_oif\_053003.pdf">https://www.deploymentlink.osd.mil/du\_library/pdfs/policy\_oif\_053003.pdf</a><a href="https://www.deploymentlink.osd.mil/du\_library/pdfs/policy\_oif\_053003.pdf">https://www.deploymentlink.osd.mil/du\_library/pdfs/policy\_oif\_053003.pdf</a><a href="https://www.deploymentlink.osd.mil/du\_library/pdfs/policy\_oif\_053003.pdf">https://www.deploymentlink.osd.mil/du\_library/pdfs/policy\_oif\_053003.pdf</a><a href="https://www.deploymentlink.osd.mil/du\_library/pdfs/policy\_oif\_053003.pdf">https://www.deploymentlink.osd.mil/du\_library/pdfs/policy\_oif\_053003.pdf</a><a href="https://www.deploymentlink.osd.mil/du\_library/pdfs/policy\_oif\_053003.pdf">https://www.deploymentlink.osd.mil/du\_library/pdfs/policy\_oif\_053003.pdf</a><a href="https://www.deploymentlink.osd.mil/du\_library/pdfs/policy\_oif\_053003.pdf">https://www.deploymentlink.osd.mil/du\_library/pdfs/policy\_oif\_053003.pdf</a>

Since 1993, the Department of Veterans Affairs (VA) has evaluated 1991 Gulf War veterans who are survivors of friendly fire incidents involving DU munitions. Some of these veterans

had significant inhalation exposures to DU and about one fourth still have retained DU fragments in their bodies. Even though some veterans with retained DU fragments continue to excrete DU in their urine, there have been no kidney problems, leukemia, cancers, or any other illnesses due to DU exposure identified even after many years since exposure first began. No birth defects have been reported in their children. As a result, there is no reason to believe that these service members have any elevated risk to their health due to their DU exposures. However, to be cautious, the DoD and the VA continue to medically follow veterans with highlevel DU exposures to ensure there are no long-term health effects associated with these ongoing DU exposures

Operation Iraqi Freedom (OIF) veterans who have confirmed elevated DU in their urine have the opportunity to be followed medically by the VA. If they wish to participate in the VA program, they are referred to the DU Follow-Up Program in Baltimore, MD. This program offers long-term medical monitoring and follow-up. In over 2000 OIF veterans who have undergone urine testing for DU exposure, less than a dozen have been identified with DU in their urine. All of these individuals have retained DU fragments or injuries likely involving DU fragments. Further information on the VA DU Medical Follow-up Program is available at: <a href="http://www.vethealth.cio.med.va.qov/DUProgram.htm">http://www.vethealth.cio.med.va.qov/DUProgram.htm</a>

DoD Depleted Uranium (DU) Library

http://www.deploymentlink.osd.mil/du\_library/

Depleted Uranium Web Page - DoD Deployment Health Clinical Center (DHCC) http://www.pdhealth.mil/du.asp

Depleted Uranium – VA Frequently Asked Questions Sheet http://www.va.gov/qulfwar/docs/DepletedUraniumFAQSheet.doc

USACHPPM Fact Sheet, Depleted Uranium – Individual <a href="http://chppm-www.apgea.army.mil/documents/FACT/65-050-0503.pdf">http://chppm-www.apgea.army.mil/documents/FACT/65-050-0503.pdf</a>

### Where Do I Get More Information?

DoD Force Health Protection & Readiness (FHP & R)

Phone: (800) 497-6261 http://fhp.osd.mil

DoD Deployment Health Clinical Center (DHCC)

Phone: (866) 559-1627 http://www.pdhealth.mil/ U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM)

Phone: (800) 222-9698 http://chppm-www.apgea.army.mil

Navy Environmental Health Center (NEHC)

Phone: (757) 953-0700 http://www-nehc.med.navy.mil Air Force Institute for Operational Health (AFIOH)

Phone: (888) 232-3764 http://www.brooks.af.mil/afioh/



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